Math 112
ReQuiz 03A

2022–04–03 (N)

Your name: _____

Exercise

Consider the piecewise function $f : \mathbf{R} \to \mathbf{R}$ whose rule of assignment is

$$f(x) = \begin{cases} \sin x & \text{if } x \leqslant 0 \\ x & \text{if } x > 0 \end{cases}$$

1. (1 pt) Find $\lim_{x \uparrow 0} f(x)$ (i.e. the limit from the left) and $\lim_{x \downarrow 0} f(x)$ (i.e. the limit from the right). Justify briefly.

(b) (1 pt) Is $f(x)$ continuous at $x = 0$? Justify briefly.

(c) (1 pt) Find the rule of assignment for $f'(x)$. *Hint:* $f'(x)$ is a piecewise function, with the same "split" in the domain as $f(x)$.

(d) (1 pt) Is $f'(x)$ continuous at $x = 0$? Justify briefly.